

Prevalence, Risk Factors and Pathogenetic Mechanisms Temporomandibular Joint Dysfunction

Astanov O.M. 1,

Ruzieva M.I. 2

1.2 Bukhara State Medical Institute

Abstract

This article analyzes the literature of domestic and foreign authors on the justification and implementation of a systematic approach in the diagnosis, prediction and personalized assessment of the effectiveness of treatment of TMJ dysfunction based on sociological, clinical, functional, psychological research and mathematical modeling.

Keywords: temporomandibular joint dysfunction, etiology, pathogenesis of DTMJ.

Introduction

The high prevalence of TMJ dysfunction, especially in middle-aged people, the often recurrent and prolonged nature of the course, accompanied by a decrease in the quality of life, determine the particular relevance of studying this pathology. On the other hand, the true prevalence of pathology has not been fully determined, due to the heterogeneity of diagnostic criteria [1,5,7,16].

In general, TMJ dysfunction as a nosology unites a group of diseases under numerous terms: pain dysfunction syndrome, joint pain dysfunction, musculoskeletal dysfunction, myofascial pain syndrome, neuromuscular syndrome, occlusive-articulation syndrome, which are characterized by pain in the temporomandibular joint and masticatory muscles, as well as clicking [2,5,9,18,19,21,23].

In the modern WHO International Classification of Diseases (ICD-10), the following are distinguished: K07.60 - syndrome of pain dysfunction of the temporomandibular joint; K07.61 - "clicking" jaw; K07.62 - recurrent dislocation, subluxation of the temporomandibular joint. With all these pathologies, there is a violation not only of the function of the TMJ as an articulation, but a change in the state of a complex integrating biomechanical system, to which the diagnostic process should be directed. But at present, timely diagnosis of TMJ dysfunction is ineffective due to the fact that not all specialists have sufficient qualifications on the one hand, and not all patients want to be cured on the other [21,23].

When examining students (Hamburg test) aged 20 to 29 years, it was found that 45% have TMJ dysfunction, while 33% of the surveyed were assigned to the risk group, according to the authors, this fact emphasizes the need for the speedy introduction of

convenient tools for the prevention and objective monitoring of this pathology [3,5,17,18]. According to previous studies, these authors found that the risk group and persons with signs of TMJ dysfunction can make up the prevalence of 58% of the total sample of students surveyed [4,8,9,25].

The prevalence of dysfunction reaches 24% among those who seek tomato care, while only 4% of these individuals have severe clinical symptoms, which seriously complicates the diagnosis of this pathology even at the medical [9,15,16,20].

Along with this, the success of the treatment of this pathology can be achieved only with the interaction of several specialists [6,8,11,15].

Previous data suggest that TMJ dysfunction is a form of chronic facial pain that occurs in 12% of people, with 20-80% of adults showing at least one symptom of it. Women suffering from this pathology are twice as common as men, it is important to note that women are 5 times more likely to turn to the services of doctors, which forms a heterogeneous motivational profile of patients and further complicates the timely diagnosis of pathology among the population [13,15,18].

The combination of these factors forms the lack of a unified approach to the diagnosis and treatment of this pathology, as well as the complexity of their supervision [15,16,17,22].

Risk factors for TMJ dysfunction before the development of clinical manifestations of the disease are present in 66.49% - 67.47% of patients who go to the dental clinic for treatment and prosthetics, which emphasizes the importance of rapid diagnosis of this pathology at a dental appointment [19,23].

According to a number of authors, secondary displacements of the lower jaw are one of the significant risk factors in the development of dysfunctional TMJ diseases [11,19,21,23]. The significance of intra-articular relations of the human TMJ [2] and the individual characteristics of its anatomical structure is also noted by a number of authors as a predisposing pathogenetic factor in the occurrence of dysfunctional joint diseases in adults of different ages [6,8,9,16].

The analysis of the relationship between occlusive disorders and dysfunctions of the TMJ, masticatory muscles, periodontal diseases in patients with complete dentition and dentition disorders was carried out [16,19,22].

Based on the analysis of the literature, the prospect of further study of the etiological and pathogenetic schemes of the development of the disease is now obvious, with the clarification of the central mechanisms of its formation [18,19,22]. There is an opinion of foreign scientists that the development of orthodontic techniques and the possibility of improving orthopedic rehabilitation has increased the number of adults resorting to orthodontic treatment. The increased, in their opinion, the likelihood of dysfunctional disorders in the TMJ during orthodontic interventions is explained by the duration of treatment. But it can be argued that orthodontic treatment can cause or cure TMJ dysfunction from the point of view of evidence-based medicine; therefore, a possible

association between occlusion, orthodontic treatment, and TMJ dysfunction is a matter of debate [22].

Studies on the influence of socioeconomic and demographic factors on the occurrence of TMJ dysfunction remain relevant. The study of 354 objects belonging to different economically secure strata. It has been established that economic level, age and education do not affect the development of TMJ dysfunction. It is the most common in the history of the world ($p < 0.02$). In the so-in-these-in-place, in the most insertia in the world, in the 19th-place world, in the 1980s, in the research of the research helkimo in 12% of the population, after RDC/TMD (Research Diagnostic Criteria for Temporomandibular Disorders) in 24% of cases, the craniomandibular index is used in 5.8% of cases, clinical protocols are used most often in 59% and a study using anamnestic questionnaires occurs in 35% [15,19].

Persons with early signs of TMJ dysfunction, according to the Eysenck test, are emotionally unstable individuals in 63% of cases [16,19,20]. Severe personal anxiety doubles the chances of pain and TMJ dysfunction [8,16]. Earlier studies also emphasized the prevalence of personal anxiety in patients with TMJ dysfunction, reaching 46.5% and the presence of depression in 62.1% of cases [8]. In the domestic literature, data confirming the need to differentiate complaints, during which it is required to determine the indicators of anxiety in patients with TMJ dysfunction, are considered and analyzed as important criteria for diagnosing pathology [11,19,23].

Patients with TMJ dysfunction seek help from various specialists, including otorhinolaryngologists, neuropathologists, psychiatrists, therapists, surgeons and other specialists who have insufficient experience in diagnosing this [2,5,9,16,17,20].

Based on the literature studied, it becomes obvious that TMJ dysfunction has a number of theories and factors predisposing to its occurrence: the occlusal-articulation theory is associated with the loss of teeth and their abrasion, as well as dental deformity [12,19,23] and malocclusion, resulting in a decrease in the height of the lower part of the face and a violation of functional occlusion; myogenic theory is associated with the discoordination of the tone of the masticatory muscles and the muscles that support the posture of a person; In addition to occlusive and muscular disorders, TMJ injuries, infectious diseases, endocrine disorders [9], stress, spinal diseases, as well as anatomical prerequisites [19] can be predisposing factors for the development of this pathology. There may be a history of dental procedures, long stays with an open mouth, bruises of the cervical spine, cervical osteochondrosis [15,18,19,20].

In the literature, special attention is paid to the need to use approaches that make it possible to predict the development of TMJ dysfunction by analyzing various factors [14,16,18].

The clinical manifestations of TMJ pain dysfunction syndrome have a complex polymorphic clinical picture, often resembling that of diseases that fall within the

competence of doctors of different specialties: otolaryngologists, neurologists, rheumatologists, and even psychiatrists [19].

But this does not always help to determine the cause, localization and biomechanical level of TMJ dysfunction that has already arisen, complicating the diagnostic process. Therefore, the dissemination of knowledge and hygienic skills to preserve dental health, including knowledge about the functional purpose of the TMJ, signs of disorders in it, is one of the main tasks not only of specialists in the field of dentistry, but also of primary care medical workers in the formation of a system for the prevention of dysfunction [21,23].

An important aspect of the system of preventive measures is the level of public awareness of the most common diseases. Studies of public awareness of various medical aspects are numerous and diverse [16].

In the scientific literature of recent years, there are data on the level of knowledge of the population of various groups on measures to prevent caries, periodontal diseases and some other dental diseases [11,19]. There is very little information on the level of public awareness of the manifestations of temporomandibular joint (TMJ) dysfunction in the available scientific literature, meanwhile, TMJ dysfunction ranks third in prevalence after caries and periodontal diseases [4,6,8,12,19]. The high prevalence of this disease, late diagnosis, long-term treatment make it possible to classify this pathology as a disease of medical and social significance and require caution in terms of timely prenosological diagnosis [5].

It is obvious that the qualitative implementation of this direction is possible with the use of a systematic approach based on mathematical modeling to assess the state of occlusion, masticatory muscles and TMJ as a biomechanical system. In modern studies, the role of abnormal types of occlusion in the process of changing the architecture of the articular surfaces of the temporomandibular joint and the topographic relationship of its elements has been noted, which, according to the authors, can serve as the main cause of the development of joint dysfunction [8,13,15]. Changes in the TMJ in the distal bite formed due to the retroposition of the lower jaw were studied [22]. There is evidence that anomalies in the position of individual teeth, in particular third molars, can initiate functional disorders in the TMJ and maintain dysfunction until the occlusion is normalized [11,19]. Pathological asymmetry of the facial skeleton in conditions of anomalies in the development of dentition has a direct relationship with the development of TMJ dysfunction [1,6,9,13,18]. Myofascial symptoms have been described in musculo-articular compression-dislocation dysfunction [12,16,19]. There is evidence of the development of this disease in childhood associated with the presence of bad habits accompanied by displacement of the lower jaw and provoking dysfunction of the temporomandibular joint [15,19,20]. The algorithm for examining preschool children is effective using 3D computed tomography (Fanakin V.A., 2013).

The dental status of children with connective tissue dysplasia and TMJ dysfunction was analyzed [14].

Violation of the coordinated function of the masticatory muscles in childhood, their hypertonicity, contribute to microtraumas of the articular surfaces and the intra-articular disc, leading to a redistribution of synovial fluid inside the joint, which, in turn, enhances the change in the topographic and anatomical relationship of the articulated elements [15,16,20]. Y.A. Petrosov and co-authors (2017) on the basis of histomorphological studies identified 5 types of normally functioning joints in different age groups, four of which were attributed to the most conducive to the development of TMJ dysfunction. The method of morphological study of the TMJ organ complex is described

in [15,19,23]. There are studies on the study of biomechanical parameters of blood in joint dysfunction [16,23]. Considering the TMJ as a biomechanical system, biomechanical modeling of the TMJ disc as a poroelastic body was carried out [16,23]. The presence of an occlusal obstruction in the form of premature contacts of the teeth leads to the need to avoid its influence during function, thereby triggering the mechanism of reprogramming the movements of the lower jaw, especially in the process of chewing [16,18,22].

Among the risk factors for TMJ dysfunction in adolescents, the literature notes adolescence itself, female sex and malocclusion in the transversal plane [14].

On the other hand, TMJ dysfunction is often observed in elderly patients with complete absence of teeth, in whom, during prolonged wearing of full removable laminar dentures, artificial teeth are eroded, the lower jaw is displaced, and the topographic anatomical relationships of TMJ elements are violated [12,17,20]. It is emphasized that age-related changes in the articular surfaces and joint capsule increase the likelihood of TMJ dysfunction [5,9,23]. There is also evidence that excessive opening of the mouth contributes to a reflex protective enhancement of the function of the masticatory muscles, resulting in compression of the TMJ elements on one side [15,16,17].

Postural disorders in patients with sagittal malocclusion, according to a number of authors, contribute to the development of TMJ dysfunction, and therefore it is advisable to use the method of computer optical topography and kinesiography in a comprehensive scheme for diagnosing the syndrome [7,9,20]. According to modern studies, posture disorders are associated with changes in the coordinated function of the masticatory muscles and occlusion of the teeth, which contributes to the disruption of the topographic anatomical relationship of elements [2,3,5].

The role of occlusion predictors in dentoalveolar anomalies, which form articulation disorders and the development of joint dysfunction, is emphasized [9]. According to the literature, even small defects of the dentition can create conditions for the development of TMJ dysfunction in patients with partial absence of teeth, while the predominant importance of the included defects that form a unilateral type of chewing

is noted [7,9,11,13]. The importance of secondary partial loss of teeth as a trigger for dysfunction and complications in the form of osteoarthritis is not excluded [7].

In gnathology and dental practice in general, the problem of timely detection and correction of "internal disorders" in the joint, during which a functional imbalance of joint structures is formed, remains not completely resolved in the context of the maxillofacial system [5,7,11,13]

In the domestic and foreign literature, there is no consensus on the mechanisms of the formation of pain symptoms in patients with dentition defects in combination with a decrease in the interalveolar distance [5,9,13].

There is evidence that TMJ dysfunction develops in patients with connective tissue dysplasia and is a typical manifestation of this pathology [9,15,17]. The state of bone mineral density in TMJ dysfunction has been studied [5,9,18].

Modern studies emphasize the relationship between occlusion and the postural system, which implements the functions of balance and controls muscle tone when a person maintains an upright position [5,9,13,15]. Thus, during the examination of children aged 12-15 years with TMJ dysfunction, a violation of posture and spinal deformities in various parts of all objects of study was revealed [6,7,14,21]. There are studies that describe the increase in internal disorders in the TMJ in patients with an incorrect or uncomfortable position during sleep [9,11,13].

In the works of foreign authors, it was noted that the leading etiological factor in the development of TMJ dysfunctions, which significantly contributes to their progression, are occlusive disorders caused by various types of anomalies of the dentoalveolar system and partial or complete edentulism [6,19,23].

LITERATURE

1. Алимова, Н. П. (2022). Анализ Антропометрических Параметров Лицевой Области И Физического Развития Детей С Гипертрофией Аденоидов До И После Аденоэктомии. Central Asian Journal of Medical and Natural Science, 3(3), 132-137.
2. Алимова, н. П., & асадова, н. Х. (2022). Method for determining the size of hypertrophied pharyngeal tonsils using ultrasound diagnostics. Журнал биомедицины и практики, 7(3).
3. Арсенина, О.И. Значение окклюзионных нарушений при дисфункции височно-нижнечелюстного сустава / О.И. Арсенина, А.В. Попова, А.А. Гус // Стоматология. – 2014. - №6. – С.64-67. Артющкевич А.С., 2014
4. Балязина, Е.В. Дифференциальная диагностика миофасциального болевого синдрома лица с классической невралгией тройничного нерва (клинический случай) / Е.В. Балязина, Т.А. Исаханова // Медицинский вестник Юга России. 2016. №3. С.108-112 Болдин А.В., Агасаров Л.Г., Тардов М.В. и др., 2016

5. Брагин, Е.А. Роль окклюзионных нарушений в развитии заболеваний височнонижнечелюстного сустава, дисфункций жевательных мышц и заболеваний пародонта / Е.А. Брагин, А.А. Долгалев, Н.В. Брагарева // Современные проблемы науки и образования. – 2014. – № 1. – С. 103
6. Гажва, С.И. Распространенность патологии височно-нижнечелюстного сустава у пациентов с частичной потерей зубов / С.И. Гажва, Д.М. Зызов, С.И. Шестопалов, Н.С. Касумов // Современные проблемы науки и образования. – 2015. - №6-0. – С.193
7. Гайворонский, И.В. Анатомические предпосылки синдрома Костена / И.В. Гайворонский, И.В. Войтяцкая, А.К. Иорданишвили, М.Г. Гайворонская// Курский научно-практический вестник "Человек и его здоровье". 2014. №1. С.24-29.
8. Гелетин, П.Н. Морфофункциональные изменения височнонижнечелюстного сустава при стенозировании общих сонных артерий в эксперименте / П.Н. Гелетин., В.А. Ваньков // Морфологические ведомости. - 2016.-N 1.-С.28-32.
9. Дмитренко, І.А. Особливості стану зубощелепної системи у хворих із середніми і великими дефектами зубних рядів / І.А. Дмитренко, З.Р. Ожоган // Український стоматологічний альманах. 2014. №4
10. Жулев, Е.Н. Распространенность заболеваний височно-нижнечелюстного сустава среди студентов нижегородских вузов / Е.Н. Жулев, Н.Г. Чекалова, П.Э. Ершов, О.А. Ершова // Медицинский альманах. 2016. №2 (42). С.166-168.
11. Akbarov, A. N., & Jumaev, A. K. (2019). The choice of materials depending on the topography of partial dentition defects. *ACADEMICIA: An International Multidisciplinary Research Journal*, 9(12), 46-49.
12. Akbarov, A. N., & Jumayev, A. (2020). Hygienic condition of prostheses in patients with partially removable dental prostheses. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 17(6), 14351-14357.
13. Alimova N. P. Anthropometric parameters of the head and maxillofacial region in children with adenoids //International Engineering Journal for Research & Development. – 2020. – Т. 5. – №. ISCCPCD. – С. 2-2.
14. Alimova N.P. Anthropometric Parameters and Facial Analysis in Adolescents// International Research Development and Scientific Excellence in Academic Life /2021/85-86
15. Alimova, n. P., ilyasov, a. S., & kamalova, s. M. (2022). Indicators of anthropometric indicators of physical development of children i childhood period of bukhara region. *Research journal of trauma and disability studies*, 1(9), 41-48.
16. Dugashvili, G. Temporomandibular joint disorder (review) / G.Dugashvili, G. Menabde, M. Janetidze, Z. Chichua Amiranashvili // Georgian medical news. – 2013. - №2(215):17-21.

-
17. Pulatovna, A. N., Muzaffarovna, K. S., & Radjabovich, B. R. (2023). Results of anthropometric studies of the maxillofacial region of children with hypertrophy of the adenoids. *Open Access Repository*, 4(3), 1183-1194.
 18. Reissmann, D.R. Temporomandibular disorder pain is related to the general disposition to be anxious / D.R. Reissmann, M.T. John Seedorf H., S. Doering, O. Schierz // *J Oral Facial Pain Headache*. 2014, Fall; 28(4): 322-30.
 19. Schmid-Schwap, M. Sex-specific differences in patients with temporomandibular disorders / M. Schmid-Schwap, M. Bristela, M. Kundi [et al.] // *J. Orofac. Pain.* – 2013. – Vol. 27 (1). – P. 42-50.
 20. Sena, M.F. Prevalence of temporomandibular dysfunction in children and adolescents / M.F. Sena, K.S. Mesquita, F.R. Santos, F.W. Silva, K.V. Serrano // *Rev Paul Pediatr*. 2013. Dec; 31(4): 538-45
 21. Shi, J.J. The relationship between partial disc displacement and mandibular dysplasia in female adolescents / J.J. Shi, F. Zhang, Y.Q. Zhou et al. // *Med. Sci. Monit.* – 2010. – Vol. 16. – P. 283–288
 22. Zhumaev, A. K. (2020). Partial defects of dental rows results of the questionnaire and clinical assessment of the condition of removable prostheses. *Middle European Scientific Bulletin*, 6, 94-97.
 23. Zhumaev, A. K. Of Partial Defects of the Dental Rows of Dynamic Study of the State of the Mucosa of the Oral Cavity in the New Conditions of Functioning. *International Journal on Integrated Education*, 3(12), 61-63.